

ON TWO NEW ROTIFERS.

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PLATE 7.

1. *Taphrocampa nitida*, sp. nov.

Sp. ch.—Body plump, cylindrical; brain clear; a decurved frontal hood; eyes two, pale; an inconspicuous tail; foot and toes small, somewhat ventrally placed.

For many years the author was an almost daily student of the Rotifera of the Rossendale district; regular "fishing" excursions were made to a limited number of ponds, and notes were taken of the gatherings. So systematically and well was the district worked that the finding of an unfamiliar Rotiferon was a very exceptional occurrence. Circumstances have prevented my doing any microscopical work for over six years; and on resumption, a few weeks ago, the remarkable thing is that a very considerable number of the Rotifera captured are species that never occurred to me in my former close study of the class. From this it would appear that there may be a gradual though material change taking place in the Micro-Fauna, and presumably in the Micro-Flora of various waters, even where there is no appreciable alteration in the conditions—a point which, so far as I am aware, has not previously received recognition.

From a pond rich in Micro-Algæ, and which has afforded me many unusual forms of the Rotifera, I collected this new *Taphrocampa*. In this species, which is plump and grub-like, there are not so many rings as in the three other recorded species. I could never make out more than five or six, and what I may term the internodes were convex rather than concave; indeed, the annulation in this form is not nearly so prominent a character as in the

others, but is unmistakable on close study. The head is rounded, with a frontal hood not differing from *T. Saundersiae*, and when seen in front view, a position which does not frequently present itself, the two pale but unmistakable eyes show prettily through the base of the transparent hood, being situated in front of the brain. The ciliated face is rounded and somewhat prone, with only feeble ciliary action. The mastax is no larger—I believe smaller—than the brain; and the trophi, which are of the forcipate type, do not nearly fill up the bulb, in which they seem to hang very loosely. They are moved in a very jerky way by the muscles of attachment, and, as in the other species, can be brought to the very front of the prone face. When the animal is fully extended a slender œsophagus of moderate length is seen to connect the mastax and stomach. Under the same conditions of extension there is a distinct neck behind the globose head, and the anterior thread-like muscles are well displayed. The stomach in my specimens was ample, and full of bright green and brown food particles; the intestine was about the same size as the stomach; the ovary ordinary in type and position. Neither lateral canals nor vibratile tags were detected, nor were there any indications of auricles; though, as the integument was of almost glassy transparency, these details ought to have been visible if present. I also failed to detect either salivary or gastric glands. The tail can hardly be said to project beyond the posterior, truncated part of the body; but, as the anus is situated between a loose fold of the skin and the foot, it is technically a tail. Foot bulb and toes very small, and placed somewhat ventrally. I have little to communicate as to the habits and manners of the species; I never saw it swim, and should imagine its natatory powers are of the feeblest description. The body was often violently contracted, and it had the peculiar grub-like habit of bending its anterior and posterior parts simultaneously, first ventrally and then dorsally. Length, at characteristic extension, about $\frac{1}{150}$ of an inch.

Habitat.—Pond in Rossendale.

Since the foregoing was written, Mr. Bryce has been kind enough to send me a translation from Bergendal's "Rotifera of Greenland," in which occurs a description of a new Taphrocampa, which he names *T. Levenseni*. This species is certainly very different from my *T. nitida*, and, as the author points out, stands nearly midway between *T. annulosa* and *T. Saundersiae*. It has

the chalky brain-mass and cervical eye of *T. annulosa* and *T. selenura*, which are not present in my *T. nitida*. In fact, the three forms *T. annulosa*, *T. selenura*, and *T. Levenseni* show strong evidences of their notommatous relationship, while my *T. nitida* is evidently an annectant form with Gosse's genus *Proales*. There are still two newly described species with the characters of which I am unacquainted—viz. *T. viscosa* of Levander and *T. clavigera* of Stokes. Judging from the specific names, one would be inclined to say that they represent species different from *T. nitida*.

2. *Callidina cataracta*, sp. nov.

Sp. char.—Trunk brown; integument leathery, minutely shagreened and slightly viscid; 14 strongly marked longitudinal ridges, the 4 central ones not parallel; the 2 anterior central ones approximate, and then diverge to about the beginning of the second central segment, where they are connected with the next pair by a transverse fold; posteriorly they are broken up and connected by several cross-folds, so as to form a parquet-like pattern; with 4 anterior spines, 2 medio-dorsal, and 2 lateral; anterior ventral margin, with a central curved excavation; 8 rough spines, with acuminate points in a single transverse row, just behind the middle line, following which is a deep, rounded depression; corona (0.070 mm.) wider than neck (0.050 mm.), with a rather deep, square sulcus (0.016 mm.); foot of 5 segments; antenna long (0.030 mm.); spurs small (0.009 mm.) and conical, slightly separated at base; toes 4, in 2 unequal pairs; rami formula 2/2. Length from $\frac{1}{70}$ to $\frac{1}{60}$ of an inch (0.350 mm.).

In recent years the additions to the genus *Callidina* have been very numerous. In Hudson and Gosse's monograph only ten species were admitted; but since that time, through the labours of several Continental microscopists and one or two indefatigable members of the Quekett Club, the number has been brought up to 34; and I here describe another of the spinous forms of the genus. It is very close to *C. alpium*, but still nearer to a spinous form found near Geneva by Dr. Weber. Indeed, it has only been by a further study of drawings of the latter, kindly lent to him by Dr. Weber, that Mr. Bryce has been enabled to separate them, and he now considers them distinct species. As I understand that Dr. Weber has now published his work on the Bdelloidæ,

microscopists will be in a position to compare the forms. It will, however, be advisable to characterise my *C. cataracta* rather more fully than is usually necessary.

About three miles from my residence, in a narrow gorge, there are some almost perpendicular rocks, from 80 to 90 ft. in height, down which flow, at several points, considerable streams of water. Here the rocks are covered with golden saxifrage, mosses, and confervoid Algae, and it is chiefly from the latter that I procure the new Callidina. It is one of the larger forms of the Bdelloida and very Philodina-like; indeed, I at first took it, or rather mistook it for *P. aculeata*, but a short examination proved that it could not be that Rotiferon, and as there are no eyes, it is technically a Callidina. It is an extremely sluggish animal,—it may be under observation for hours without everting either its anterior or posterior parts, and these may be exerted for a similar period, and yet no disposition be shown to evert the corona. However, on being kept in confinement for a day or two, some of this shyness disappears, and it then feeds with tolerable freedom. From several observations made under these favourable conditions, I am able to say that in feeding, the foot is fairly extended, but the neck is much retracted—so much so that very frequently the antenna is protruded between the two medio-dorsal spines, exactly as in *Brachionus*. The lobes of the corona are wider than the neck; there is a rather deep, square sulcus between them, and a considerable thickening of the neck immediately below. The antenna was two-jointed, slender, and about as long as the width of the neck at its juncture with the trunk, and set with diverging setae at the tip. The foot was rather long and tapering, at full extension of, I think, 5 joints, although at times it is difficult to see more than 4. The spurs are small and conical, with a quite perceptible interval between them. The toes are very seldom everted, and then as usual instantly covered by the penultimate segment of the foot; but there were 4 toes, in two unequal pairs, each pierced by several pores. The most striking peculiarities, however, were in the trunk, and by these it may the most easily be recognised when seen. This was brownish, the integument of thick, leathery texture, with 14 longitudinal ridges, the 8 dorsal ones acute and strongly marked, the latero-ventral ones fainter, the outer pair occasionally very indistinct. The four central ridges are not

parallel, like the others; but anteriorly the two central ones approach each other, and then diverge to about the juncture of the first and second central segments, where they are connected to each other and the next pair by a transverse skin-fold; posterior to the dorsal spines these 4 ridges are broken up and connected by cross folds in such a manner as to form a sort of parquet-like pattern. On the ventral aspect these ridges are absent, but there are faint indications of transverse plications. On the anterior dorsal edge there are two conical spines close together, with their apices forwards; and on the extreme lateral edge, but just below the anterior margin, there are two low spines, which, on the extension of the animal, are at right angles to the body; and between each pair of ridges there are prominences, more or less marked, which vary considerably in different individuals, sometimes almost approaching spines in character. The anterior ventral edge is excavated in a curved manner, and one or even two pairs of low spines may sometimes be seen on the shoulders, in a line with the lateral spines, and like them, below the anterior edge, and at right angles to the ridges; but these are, I believe, only temporary. I have seen individuals entirely without them, while perhaps the next had either one or two pairs. Just behind the median line there is a transverse row of 8 strong, rough spines, with acuminate points, diminishing somewhat in size as they approach the sides; occasionally an extra pair may be visible, and as I saw several specimens with this extra pair, I was led in the first instance to describe the species as having ten spines in the row, but they are only temporary, and may be seen gradually to melt away upon the extension of the animal. Indeed, the formation of these temporary spines seems to be a peculiarity of this species, and may readily lead to error. I have seen a specimen with a complete row of these spines anterior to the permanent ones, another with spines posterior to them; but in both cases they vanished while under observation. The fact is, that, owing to the thickness of the integument and the acuteness of the ridges, these temporary spines are liable to be formed on any part of the trunk, whenever contraction takes place. The spines are on the ridges, and are indeed a continuation of them, as may readily be seen either on a dorsal, but especially on a lateral view. Immediately behind the spines there is a deep rounded

depression, highly characteristic of the species. The internal organs are, I presume, normal, but the character of the integument precludes any close study of details; it was just possible to see that the jaws had two teeth, and that in the foot were two well-developed glands and ducts. I was unable to obtain any very exact measurements,* but on extension the animal will be from $\frac{1}{70}$ to $\frac{1}{60}$ of an inch in length.

Habitat.—Confervoid Algæ on dripping rocks, Rossendale.

EXPLANATION OF PLATE 7.

- FIG. 1a. *Taphrocampa nitida*, lateral view.
 ,, 1b. ,, ,, front view of head, showing hood
 and eyes.
 ,, 1c. ,, ,, mastax and jaws.
 ,, 2a. *Callidina cataracta*, lateral view.
 ,, 2b. ,, ,, dorsal view.

* The measurements in brackets have been kindly supplied by Mr. Bryce.